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Patentanmeldung Nr. PCT/EP 03/03052  
Patent application no. PCT/EP 03/03052  
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**Blatt 2 der Bescheinigung**  
**Sheet 2 of the certificate**  
**Page 2 de l'attestation**



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PCT/EP 03/03052

Anmelder:  
Applicant(s):  
Demandeur(s):

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Bezeichnung der Erfindung:  
Title of the invention:  
Titre de l'invention:

A Dental Treatment Composition

Anmeldetag:  
Date of filing:  
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24 March 2003 (24.03.2003)

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Bemerkungen:  
Remarks:  
Remarques:

Sheet No. ... 2 ...

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1      A Dental Treatment Composition

2

3      Technical Field

4

5      The invention relates to a dental treatment  
6      composition, and a process for complete dental care,  
7      including treatment of teeth and gums.

8

9      Background

10

11      A great many toothpaste compositions have been  
12      developed and marketed for several years now.

13

14      It is known that toothpaste formulations may contain  
15      various components, in particular water, a wetting  
16      agent (for example glycerol, sorbitol, xylitol or  
17      polyethylene glycol, etc.), a thickener ( for  
18      example xanthan gum), a source of fluoride (usually  
19      sodium fluoride or sodium monofluorophosphate (anti-  
20      tooth-decay), a colorant, a flavouring, a sweetener,  
21      a fragrance, a preserving agent, a surfactant and/or  
22      additive, etc.

1

2 They generally also contain an abrasive agent which  
3 must, by its mechanical action, remove dental plaque  
4 while at the same time not subjecting the teeth  
5 themselves to unacceptable abrasion.

6

7 Among the abrasive agents usually employed, mention  
8 may be made of sodium bicarbonates and calcium  
9 phosphates, sodium metaphosphates, aluminas and, in  
10 recent years, silicas.

11

12 However, the agents of the prior art, in particular  
13 silica and alumina abrasive agents in toothpaste  
14 compositions, are not always of desirable refractive  
15 index or porosity.

16

17 It is an object of the invention to overcome at  
18 least some of the above disadvantages.

19

20 Statements of Invention

21

22 According to the invention, there is provided a  
23 personal care treatment composition which comprises  
24 a particulate erasing agent, the particles of the  
25 erasing agent being dimensioned to roll along a  
26 surface. Ideally, the personal care treatment  
27 composition is a dental treatment composition. Other  
28 types of personal care treatments include skin  
29 exfoliation and personal washing.

30

31 In this specification, the term "particulate erasing  
32 agent" should be understood as referring to a  
33 multiplicity of relatively soft particles which are

1 dimensioned to be rolled along a surface and which,  
2 during such a rolling action, pick up debris,  
3 stains, plaque, tartar or the like from the surface,  
4 especially dental and gum surfaces, in a manner  
5 similar to which an eraser rubs pencil markings off  
6 a page. As such, the term preferably excludes  
7 abrasive particles.

8

9 In one embodiment of the invention, the dental  
10 treatment composition comprises at least 3% water  
11 (W/W), generally at least 5% water (W/W).  
12

13 Preferably, the particles of the erasing agent  
14 comprise a precipitate or agglomerate of an  
15 insoluble alkali metal salt. Typically, the salt is  
16 a carbonate. Suitably, the alkali earth metal is  
17 calcium. Most preferably, the particles of the  
18 erasing agent comprise a precipitate or agglomerate  
19 of insoluble calcium carbonate.  
20

21 Ideally, the particles of the erasing agent are non-  
22 crystalline.  
23

24 Preferably, the particles are generally round. In  
25 this specification the term "generally round" as  
26 applied to particles should be understood to mean  
27 any shape which of particle which enables the  
28 particle to easily assume a rolling motion when  
29 moved along a surface. As such, while the term is  
30 primarily intended to refer to spherical particles,  
31 it is not intended to exclude other types of  
32 spheroids such as spheres having an oblong or

1     elliptical shape. Typically, the particles will  
2     have an irregular surface configuration.  
3

4     Ideally, the particles are relatively soft.  
5     Generally, the particles have an average hardness of  
6     less than 10 Mohs, typically less than 8 Mohs, and  
7     preferably less than 6 Mohs. Typically, the  
8     particles will have an average hardness of at least  
9     1 Mohs, and preferably of at least 2 Mohs. In a  
10    preferred embodiment of the invention, the particles  
11    will have an average hardness of about 3 Mohs.  
12    Typically, the particles have an average maximum  
13    diameter of between 30 and 1000 microns.  
14

15    In one embodiment of the invention, the particles  
16    have an average maximum diameter of between 30 and  
17    1000 microns, preferably between 60 and 120 microns,  
18    and most preferably between 70 and 80 microns.  
19

20    Typically, the particulate erasing agent comprises  
21    between 3 and 75 % of the total composition (W/W).  
22

23    In one embodiment of the invention, the dental  
24    treatment composition comprises a paste or a gel...  
25    Preferably, the dental treatment composition is a  
26    toothpaste. Alternatively, the dental treatment  
27    composition may comprise a teeth whitening  
28    composition, a plaque removal composition, a  
29    toothgel, a polishing paste, or the like.  
30

31    In one embodiment of the invention, the dental  
32    treatment composition comprises a powder which,

1     optionally, is used as an additive in a further  
2     component or components.

3

4     The invention also relates to the combination of a  
5     dental treatment composition according to the  
6     invention contained within a dispenser for the  
7     composition. Typically, the dispenser comprises a  
8     deformable tube. Other types of dental care  
9     composition dispensers are also envisaged.

10

11    The invention also relates to a particulate erasing  
12    agent comprising particles which are dimensioned to  
13    roll along a surface, for use in a dental treatment  
14    composition.

15

16    Suitably, the particles of the erasing agent  
17    comprise a precipitate or agglomerate of an  
18    insoluble alkali metal salt, such as calcium  
19    carbonate. Ideally, the dental treatment composition  
20    is a toothpaste or a toothgel. Preferably, the  
21    particles of the erasing agent are non-crystalline.

22

23    The invention also relates to a method of treating  
24    teeth comprising the steps of:

25    - applying a suitable amount of a dental  
26    treatment composition according to the  
27    invention onto a suitable applicator for the  
28    composition;

29    - using the applicator to rub the composition  
30    onto a surface of the teeth such that at  
31    least some of the particles of the erasing

1           agent roll along at least a portion of the  
2           teeth; and  
3           - rinsing the composition off the teeth.

5      Typically, the applicator is a toothbrush,  
6      interdental brush, or soft rubber cup. When the  
7      applicator is a brush, it may be manually,  
8      mechanically or electrically operated.

10 The invention also relates to the use of the process  
11 of the invention in dental applications such as  
12 teeth whitening, plaque and tartar removal and  
13 general cleaning or polishing of the teeth, gums and  
14 mucous membranes of the buccal cavity, and  
15 prosthetic parts such as crowns, bridges and  
16 complete or partial dentures. As such, the process  
17 may involve either blast application using some form  
18 of particle accelerator, or manual application, of  
19 the treating agent. Manual application includes  
20 conventional brushing, rubbing, polishing or the  
21 like.

23 The invention also relates to the use of the process  
24 of the invention in treating bone or in skin  
25 exfoliation treatment.

27 Brief Description of the Drawings

29 The invention will be more clearly understood from  
30 the following description of some embodiments  
31 thereof, given by way of example only, with  
32 reference to the following figures in which:

1

2. Fig 1. is an illustration of a particle of a treating  
3 agent according to the invention; and

4

5 Fig 2 illustrates the process of the invention.

6

7

8 Detailed Description

9

10 Referring to the drawings, and initially to Fig 1,  
11 there is illustrated a particle, indicated generally  
12 by the reference numeral 1, which is used in the  
13 process of the invention. The particle is a  
14 particle of precipitated calcium carbonate and has a  
15 generally round, and slightly irregular, shape and a  
16 rough, irregular, surface configuration.

17

18 Referring to Fig 2, the process of the invention is  
19 illustrated in which the particle 1 is rubbed along  
20 a surface 2 of a tooth having a coating 3 of plaque  
21 to be removed. Due to the nature and the round  
22 shape of the particle 1, upon impact the particle 1  
23 rolls along the surface, rubbing the surface and  
24 absorbing the coating 3 onto a surface of the  
25 particle. This has the net effect of removing the  
26 coating from the surface without causing any damage  
27 to the surface.

28

29 Example 1

30

31 Method of production of particulate erasing agent.  
32

1 Production of insoluble calcium carbonate particles  
2 is carried out by providing free  $\text{Ca}^{++}$  in a liquid  
3 with a PH over 7 by dissolving calcium oxide in  
4 water.

5

6 Addition of  $\text{CO}_2$  results in the precipitation  $\text{CaCO}_3$ .

7



9

10 Various other methods of production of particles  
11 forming part of treating agents according to the  
12 invention have been investigated using various types  
13 of substrates including plastic, metal and polymer.  
14 Examples of these methods include:

15

16 Chemical

17

18 There are numerous chemical methods for producing  
19 particulate erasing agents. Generally, chemical  
20 methods result in very fine powder particle sizes.  
21 Such methods include Sol Gel, chemical  
22 precipitation, Reaction, reduction (hydrogen in an  
23 autoclave to reduce metal salts to the metal),  
24 decomposition (eg metal-carbonyls) and Electrolysis.

25

26 Spray drying

27

28 This is the most widely used industrial process  
29 involving particle formation and drying. It is  
30 highly suited for the continuous production of dry  
31 solids in either powder, granulate or agglomerate

1 form from liquid feedstocks as solutions, emulsions  
2 and pumpable suspensions.

3

4 Agglomeration

5

6 The most common method of agglomeration is where the  
7 constituents are physically mixed together with an  
8 organic binder. The solvent is then driven off and  
9 the resultant material sized. The binder should be  
10 burnt off during spraying. This process is used in  
11 the manufacture of NiAl, AlSi or polyester powders.

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13 constituents are physically mixed together with an  
14 organic binder. The solvent is then driven off and  
15 the resultant material sized. The binder should be  
16 burnt off during spraying. This process is used in  
17 the manufacture of NiAl, AlSi-polyester powders.

18 The use of spray drying has become another common  
19 method for the agglomeration of powders. Here, a  
20 slurry is formed with the constituents and this is  
21 then fed into a rotary spray head. Here, the slurry  
22 forms an atomised cloud which is solidified by an  
23 opposing warm air stream to produce a powder. This  
24 method is used for ceramics such as zirconia and  
25 cermets such as WC-cobalt. The powder is largely  
26 spherical but in the as spray dried state can be  
27 porous and friable. The material is often densified  
28 and stabilised by sintering and/or spray  
29 densification.

30

31 There are also methods of mechanical agglomeration  
32 (eg the Hosakawa method) where for example a hard

10

1 constituent is mechanically driven into a softer  
2 matrix particle to form a composite powder. Indeed,  
3 simple ball grinding can be used to mechanically  
4 alloy two or more constituents together.  
5 Although sintering can be used as part of the spray  
6 drying process it can also be used alone as a method  
7 to manufacture powders. The constituents are mixed  
8 together and heated to get some solid state  
9 diffusion going and then the resultant product is  
10 crushed. A number of repeated cycles can be used to  
11 promote further alloying in which case the powder is  
12 called a "reacted" powder.  
13

14 Atomisation

15 There are a number of atomisation techniques which  
16 all rely on the production of a molten pool as the  
17 source. Atomisation methods include Rotating  
18 Electrode, Vibrating Electrode (arc), Centrifugal  
19 (from a melt) and Rapid Solidification (eg aluminium  
20 ribbon). However, by far the most commonly used  
21 methods are either water or gas atomisation.  
22

23 Others

- 24 - Solid State Reduction
- 25 - Electrolysis
- 26 - Electrodeposition
- 27 - Mechanical Comminution

29 Toothpaste Compositions  
30

1 As described above, the dental treatment composition  
2 of the invention may take the form of a toothpaste.  
3 In this regard, particulate erasing agent  
4 (precipitated calcium carbonate as formed in Example  
5 2) may be added to a toothpaste composition in an  
6 amount of 20 % of the toothpaste composition (w/w).  
7 Prior to addition of the erasing agent it is sized  
8 using vibrating sieves to ensure that the particles  
9 have an average diameter of between 70 and 80  
10 microns. Other suitable sizing methods will be  
11 apparent to those skilled in the art. Details of  
12 toothpaste formulations will be well known to those  
13 skilled in the field dental treatment compositions  
14 and will not be described in any detail in this  
15 specification.

16

17 **Personal Wash Compositions**

18

19 The particulate erasing agent as produced in Example  
20 3 (precipitated calcium carbonate) may be used in  
21 the formulation of personal wash compositions such  
22 as, for example, soap, shower gel, body wash, and  
23 the like. The amount of particulate erasing agent  
24 added to the compositions can be varied depending on  
25 the type of product. Otherwise, the composition of  
26 such personal wash composition will be known to  
27 those skilled in the field of personal wash  
28 formulation.

29

30

31 The invention is not limited to the embodiments  
32 hereinbefore described which may be varied in both

12

1 construction and process step without departing from  
2 the invention.

3

4

5

6

1

1      Claims

2

3      1. A dental treatment composition which comprises a  
4      particulate erasing agent, the particles of the  
5      erasing agent being dimensioned to roll along a  
6      surface.

7

8      2. A dental treatment composition as claimed in  
9      Claim 1 having at least 3% water (W/W).

10

11     3. A dental treatment composition as claimed in  
12    Claim 1 or 2 in which the particles of the  
13    erasing agent comprise a precipitate or  
14    agglomerate of an insoluble alkali metal  
15    carbonate.

16

17     4. A dental treatment composition as claimed in  
18    Claim 3 in which the particles of the erasing  
19    agent comprise a precipitate or agglomerate of  
20    insoluble calcium carbonate.

21

22     5. A dental treatment composition as claimed in any  
23    preceding Claim wherein the particles of the  
24    erasing agent are non-crystalline.

25

26     6. A dental treatment composition as claimed in any  
27    preceding claim in which the particles have an  
28    average hardness of between 1 and 10 Mohs.

29

30     7. A dental treatment composition as claimed in  
31    Claim 6 in which the particles have a hardness  
32    of between 2 and 4 Mohs.

1

2 8. A dental treatment composition as claimed in any  
3 preceding claim in which the particles have an  
4 average maximum diameter of between 30 and 1000  
5 microns.

6

7 9. A dental treatment composition as claimed in any  
8 preceding claim in which the particles are  
9 generally round.

10

11 10. A dental treatment composition in which the  
12 particulate erasing agent comprises between 3  
13 and 75 % of the total composition (W/W).  
14

15

16 11. A dental treatment composition as claimed in any  
17 preceding claim in the form of a paste, gel or  
powder.

18

19 12. A dental treatment composition as claimed in  
20 Claim 11 which is a toothpaste, a toothgel, a  
21 polishing paste or a powder additive.  
22

23

24 13. In combination, a dental treatment composition  
25 according to any of Claims 1 to 12, contained  
within a dispenser for the composition.  
26

27

28 14. The combination of Claim 13 in which the  
dispenser comprises a deformable tube.  
29

30

31 15. A particulate erasing agent comprising particles  
32 which are dimensioned to roll along a surface,  
for use in a dental treatment composition.

1

2 16. The use of Claim 15 wherein the particles of the  
3 erasing agent comprise a precipitate or  
4 agglomerate of an insoluble alkali metal  
5 carbonate such as calcium carbonate.

6

7 17. The use of Claims 15 or 16 in which the dental  
8 treatment composition is a toothpaste, a  
9 toothgel, a polishing paste or a powder  
10 additive.

11

12 18. The use of any of Claims 15 to 17 wherein the  
13 particles of the erasing agent are non-  
14 crystalline.

15

16 19. A method of treating teeth comprising the steps  
17 of:

18 - applying a suitable amount of a dental  
19 treatment composition of any of Claims 1 to  
20 12 onto a suitable applicator for the  
21 composition;

22 - using the applicator to rub the composition  
23 onto a surface of the teeth such that at  
24 least some of the particles of the erasing  
25 agent roll along at least a portion of the  
26 teeth; and

27 - rinsing the composition off the teeth.

28

29 20. A method according to Claim 19 in which the  
30 applicator is a toothbrush, an interdental  
31 toothbrush, or a soft rubber cup.

32

1

1. Abstract

2

3. A dental treatment composition comprises a  
4. particulate erasing agent having particles which are  
5. dimensions to roll along a surface. The composition  
6. has at least 3% water and the particulate erasing  
7. agent comprises a precipitate or agglomerate of an  
8. insoluble alkali metal carbonate. The composition  
9. may be a toothpaste, a toothgel, a polishing paste  
10. or an additive powder. A method of treating teeth  
11. to remove dirt, debris, stains or the like which  
12. employs a composition according to the invention is  
13. also described.

1/1

Fig. 1

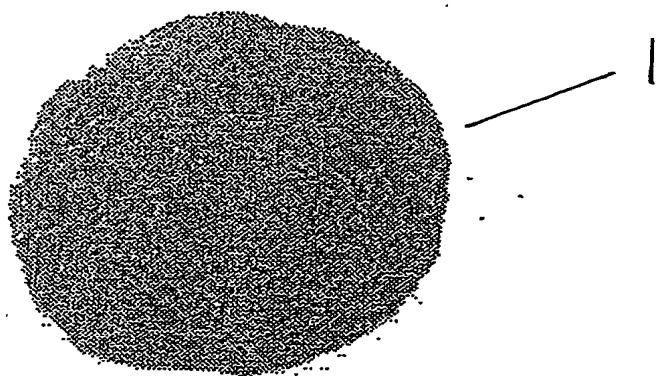
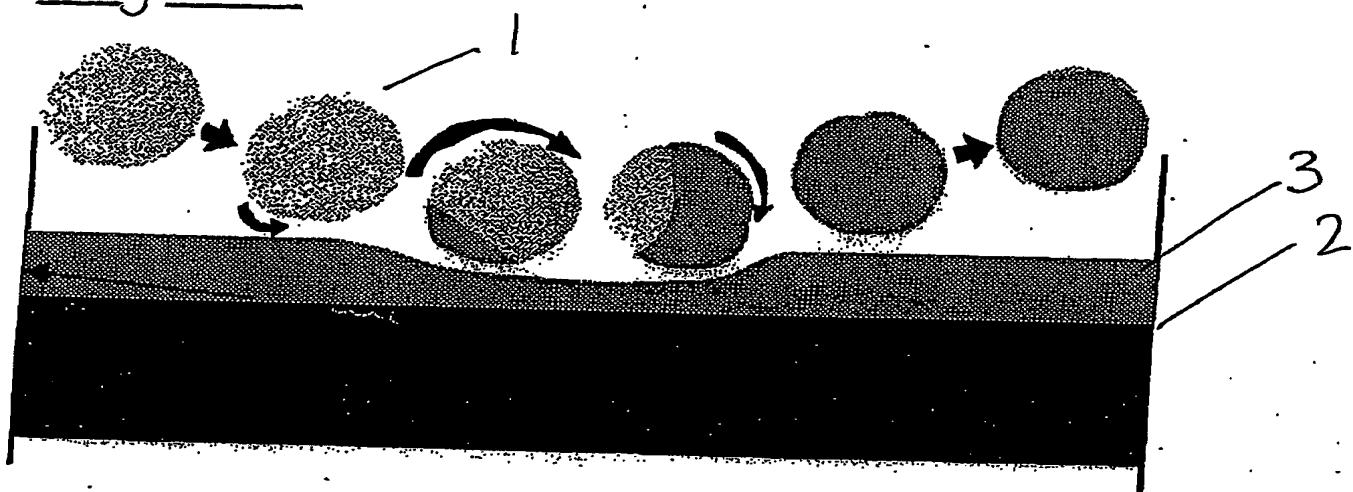


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